This Vital Unit of Motor Car Should Be Handled Gently.

Outside the steering mechanism and possibly the brakes there is no other individual unit in the motor car quite individual unit in the motor car quite so vital to the efficient operation, by which I mean the actual driving, of the motor car as the clutch. The clutch that is properly taken care of and adjusted performs its functions in such a way that its very existence is almost forgotten. But let the part get out of gear, the facing fall, the bearings wear and the results are instantaneous and unpleasant. An alling clutch is one wear and the results are instantaneous and unpleasant. An ailing clutch is one of the most prodigious wasters of power and reducers of efficiency that can be imagined. In fact, a badly disorganized clutch can reduce the whole mechanism of the car to impotency.

The clutch occupies a peculiarly strategic position in the mechanism. It is the connecting link between the engine and the transmission, acting as a flex-

and the transmission, acting as a flexand the transmission, acting as a flex-ible connection whereby the power may be applied to or removed from the rear wheels. The operating function of the clutch is controlled by a pedal, and the part must be employed each time a change of gear is necessary. Ob-viously the clutch is a fairly busy bit of

Modern cautches fall readily into three types, according to whether they run in oil or dry. disc clutches are divided into two sub- in the "unusual" ranks. They have se

Not very long ago cone clutches were Not very long ago cone clutches were almost universal on American cars, but within the past few years there has been a notable change in this respect and at the present time disc clutches are in the majority, with cone in second place. As the name implies, the cone clutch embodies a cone as the driven member. This cone fits into the fig-wheel, which has been hollowed out to wheel, which has been nollowed out to receive it, the engagement being assured by a spring fitted for that purpose. The surface of the clutch is faced with leather or with a fabric composed prin-cipally of asbestos to reduce the danger of burning or charring. Pressure on the power is at once removed from the driv-ing mechanism. When the foot is re-moved from the pedal the cone is pressed home, the surface grips the inside of the cavity in the flywheel and the power is transmitted to the rear wheels. Simple transmitted to the rear wheels. nough and efficient in action as long

as the part is properly maintained.

In the so-called multiple disc clutch
the part is fitted with a number of small sometimes more than fifty being The inside of the flywheel is fitted with a drum on the inner sur face of which are arranged keys designed to maintain the discs in a fixed position with regard to each other. The discs attached to the flywheel act as driving discs, and the driven discs which fit in between are attached to the clutch shaft itself. As the clutch is released the discs separate and the power is re-moved from the driving mechanism. When the clutch is pressed into engage-ment the discs come together and the power is sent back through the trans-mission to the rear wheels.

Finally there is the plate clutch, which is really only a variation of the disc type. Instead of using a number of amali discs this type employs three large plates, of which two are the driven plates and one is the driving plate, fixed on the flywheel. The plates may be of metal or they may have a fabric facing. Within the last year or two the plate clutch has made considerable strides into pularity and there seems to be a right future for this type.

And now to examine in detail the ail-

ents to which the different types of dutches are helr and suggest the smedies to be used for each. The conethe shaft and suitable bearings. In addi-tion there is a spring, whose function s to press the cone into engagement with flywheel. In some cases instead of ne main spring, three or even mor smaller springs are used and in thi case they are mounted at right angles to the cone. In course of time the ten-sion of the clutch spring is quite likely o suffer impairment, so that it has not strength enough to press the cone firmly come. In this case the result is alipping home. In this case the result is slipping and the cure is adjustment of the spring. On almost all modern clutches an adjustment is provided for regulating the tension of the spring; usually the adjustment takes the form of a collar behind the spring, and it is a simple matter to change the tension by this means. When no means of adjustment is provided it is necessary to fit a shim or even to renew the spring, but fin any event the spring must be kept fit to perform its function or much power will be wasted through slipping.

The clutch shaft usually rests upon two hearings, generally of the ball type,

two hearings, generally of the ball type, one located in the centre of the fiywheel and the other placed to take up thrust that results when the clutch is released. Wear in these bearings is a front seat because it's warmer behind the serious matter. Since on their proper action rests the functioning of the clutch, any suggestion of wear should be at seat have windshield protection too? It

once taken up.

In many cone clutches there is a tendency to "grab," that is, to engage jerkily, instead of smoothly as is intended. Many makers fit a series of springs either in the flywheel or under the leather facing of the cone, so that engagement takes place more gradually. In cases where grabbing is habitual removing the leather or fabric facing, soaking it over night in neat's foot oil soaking it over night in neat's foot oil and then running it through a clothes wringer will often serve to soften the

writinger will often serve to soften the leather and make gradual engagement possible.

On the other hand, when the facing of the some ciutch becomes too heavily oil souked, it tends to slip and the result is a heavy loss of power. The cure in this case is simply to sprinkle a light layer of fuller's earth over the curface, and

ington authorities will be compelled to enforce even more drastic rules on economies next spring, says Harry S. Houpt.

Incidentally, when treating the facing of the clutch the flywheel surface should also be cleaned off.

Lubrication of the clutch is one of the meet important things to be remembered. The bearings at the throwout itself must be given plenty of proper libricant. Generally oil or grease cups in provided for this purpose, and these likes the filled or turned down at regularity intervals; one neglect may cause most trouble.

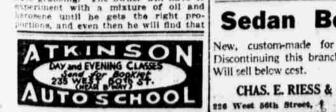
All the suggestions made for caring of the suggestions made for caring or come clutches, except, of course, one for caring for the leather facing.

The bearings must be kept up to the trik, the bearings must be regularly suggestions must be regularly and the filled or turned down at regularity of the leather facing.

The model internal combustion engine will usually operate on a fuel mixture is leaner, and see what you can do toward conserving gasolene. "The model internal combustion engine will usually operate on a fuel mixture ranging from eight parts of air to one of gasolene. Operating conditions are better when the mixture is leaner, but as a general rule the car owner tends to use a mixture nearer the first proportion than the second. Obviously a mixture at eight to one contains almost twice as much gas as ope at fourteen to the continued, "in which the consumption of fuel cannot be reduced by a proper adjustment of the car's carbureter, which is where most of the leader of the chart of the Hudson Motor Car Company of New York.

The model internal combustion engine will usually operate on a fuel mixture ranging from eight parts of air to one of gasolene. Operating conditions are better when the mixture lis leaner, but as a general rule the car owner tends to use a mixture nearer the first proportion than the second. Obviously a mixture at eight to one contains almost twice as much gas as a galon, a total asving of 25, cents a gallon, of cents a gallon, a total saving of 2

tion than the second. Obviously a mix-ture at eight to one contains almost twice as much gas as one at fourteen to one. Therefore the first thing the car rk, the bearings must be regularly oricated. In the case of disc clutches oning in oil there will sometimes be owner who aims to maximum efficiency should do is to make sure that his car-bureter is properly adjusted to give the leanest mixture consistent with satisuble in finding just the right lubri-Too heavy an oil will cause spin iling. If the oil disc clutch is permitted to run dry the plates may burn up. If the oil used is too thin, it tends to pro-less grabbing. The owner will have to factory running.
"If the car owner is unable to make
this simple adjustment himself, he should



in winter he will have to make the mixture thinner than in summer. Some of the oil disc clutches have cork inserts in the discs. When these wear down so that renewal is necessary, this is a job for the service station, as the cork pleces must be pressed into place by means of a special machine.

In most disc clutches an adjustment is provided for compensating for wear of the discs. By adjusting the spring, more pressure is added, making up for wear in the plates. In the plate clutch a simple set screw adjustment usually

a simple set screw adjustment usually is used for this purpose. In the dry disc type slipping may usually be cured by flushing the part out with kerosene to remove the deposits of oily matter to remove the deposits of oily matter and gum that are causing the trouble. However, a great deal of all clutch trouble as relates to slipping, the commonest ill of all, is the fault of the driver, who keeps his foot pressing just slightly on the clutch pedal, but enough to cause slipping. This tends to wear the facing or the discs, as the case may be, so that the effects are cumulative. Therefore, we may paraphrase the familiar saying to make it "watch your millar saying to make it "watch

COLT-STRATTON CO. IN UNUSUAL DRIVE

Week's Programme of Demonstrations and Lectures on Truck Performance.

The Colt-Stratton Company, the newly appointed metropolitan distributers of Day-Elder trucks, have again been listed aside the week of November 2 to 9 in-clusive for a comprehensive study of modern motor methods. The Dodge Bros. business car chassis, showing panel, screen, bus and ambulance bodies and one to six ten models of trucks will

be shown, including the latest type Lappear trailers with demonstrations of their practicability.

One of the important parts of this exhibit will be the cost finding department. Every man's problems, which are the result of his use of motor vehicles, will be accurately dealt with The heart be accurately dealt with. The best way to use a truck, the correct way to drive the truck, the best way of conserving the truck and its parts, the most serving the truck and its parts, the most economical way of operating the truck are all points which will be thoroughly delais in Washington on what is exgone into. It can readily be seen that this alone will enable many owners to a disposition on the part of all the lead-

ald greatly in cutting down expenses.

To illustrate how completely the modern transportation field will be covered to maintain adequate service for all arrangements have been made with well vehicle is warfare, and the vital part it is playing in the winning of the war; the modern motor vehicle in rural express; the modern motor vehicle in all commercial industries; the modern motor vehicle as used in intercity freight hauling: the modern vehicle in bus work; the modern vehicle in ambulance and funeral work; the new motor truck traffic system and the store door delivery plan.
Photographs and moving pictures will

implify the above subjects.
In addition to this Colt-Stratton Company are adding to their present pas-senger car course of instruction a school to educate the users of Day-Eider trucks in the most economic way to operate and make the necessary repairs. It is the intention of the company to get away from the display type of exhibit and make it interesting and instructive to every one regardless of their business and their present method of transpor-

ler owners.
"The man who needs a car to-day Rubber is very quickly disintegrated by oil, and at the same time it has a most unfortunate capillary affinity for the oil. For this reason it is very im-portant to keep oil away from the rubber insulators that are used in con-nection with the conductors and wires of all the circuits of the magneto. Al-sentiments of all the leading dealers on though oil is not a conductor of elec-thereof. They are going to "stick" and tricity, it ruins the insulation and the result is the breakdown of the insula-tion and short circuits.

Sedan Bodies

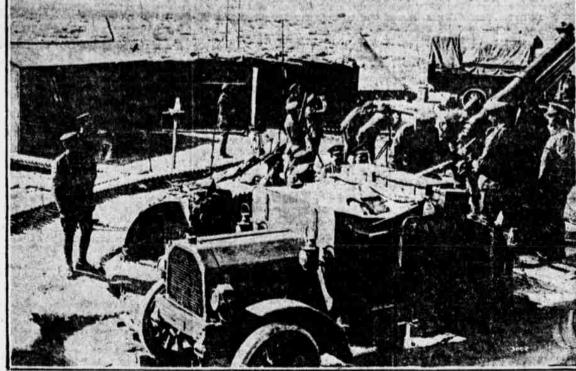
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about to send a shot at it. It will be noticed that two men are getting the

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closed cars already are in de

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an adequate service for owners. I'll go still further and say that our front doors will be kept open even if we should not have a car for sale—a condition which of course is not at all likely. No matter how long the war lasts these offices will be a headquarters for Chand.

offices will be a headquarters for Chand-

and does not buy one is making a mis-

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that

just spotted a German plane and is dangerous looking shell. Officers with a most mobile and effective weapon. The ents of the enemy The British troops have found this air- Vehicle Corporation

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PUTTUN TROOP DA BUY LIBERTY BONDS

owners, has resulted in greater activity on Automobile Row during the past few The Liberty Loan Committee has con- | yous last days of the drive. weeks. Dealers are preparing for the closed car season now and report a de-mand for this type of car which is so

ful calliope. Miss Darling started on her which reached \$100,000, lasted until quest for bonds during one of the stren- 1:30 o'clock in the morning.

cording the sales temporarily ran short. Then the truck was rushed back to Ful-Thousands of dollars worth of bonds ton headquarters, the stock of cards was Thousands of dollars worth of bonds, were sold by the organization of fast workers shown in the accompanying photograph headed by Miss Grace Darling, the well known movie actrees, and supported by wounded American soldiers, members of the American Woman's League, singers and planists. A plano was mounted on a Fulton truck donated by the Fulton Motor Truck Company of 1800 Broadway, appropriate signs were attached and in the wake of a powerful calliope, Miss Darling started on her which reached \$100,000, lasted until

Owners' Service Department

take. We can govern the activities of our organization and remain on the job for all Chandler owners, but we cannot govern the price of cars. Certainly the much?—OLIVER JONES. isn't the
A light machine oil, such as 5 in 1, eise to
and only a few drops. Don't be too libthomas.
eral, as this part needs only a little. Aside prices of all new automobiles will go

Adding Protection to Victoria Top.

Will you please gove not too be considered in the construction of the

The battery change is all right. The first figure is the voltage, which is the same in both cases. The second figure D. truck in winter?—L. F. Mason. gives the capacity in ampere hours. One Mobile oil A is recommended by this simply has a greater current capacity manufacturer.

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I have an old Bosch magneto on my car and I want to ask you what kind of Hudson carbureter on and it drips gasooil I ought to use in it and about how lene when the engine is stopped. It

Aside from the nut under the float lubrication, and more may injure it.

bowl there is one under the body. Remove the latter and you will be able

Please tell me how tight to adjust a to get at a gland, which evidently is Please tell me how tight to adjust a fan beit. Ought it to bind so that it is hard to move?—Dan Pamen.

Certainly not. It should be just tight enough to prevent undue slip in operagland shown in the sectional view of the

can I use a 6-100 battery in place of satisfactory. Be sure, however, of a 6-80? Will it cause the lamps to buy from a regular dealer and to get to burn out, or what is the objection?— a car that is being manufactured at the present time.

What grade of oil is used in an F. W



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Will the airplane supplant the auto ling the New England coast, besides after the war? Is there a future for the giving lessons to pilot recruits.

Then there is the late Lieut, Guyneafter the war? Is there a lutter to after the war after the war? Is there a lutter to after the war after the war after the war? Is there a lutter to after the war after the war after the war? Is there a lutter the war after the war? Is there a lutter to after the war after the war? Is there a lutter to after the war after the war? Is there a lutter to after the war after the war? Is there a lutter the war after the war after the war? Is there a lutter the war after is sure; and no one can foretell how He was only able to get a commission great the growth of the aero industry because of inside friends who won the will be, but there is every assurance day for him. will be, but there is every assurance

Also there is Lieut. Benedict, one of
that it will be as phenomenal as the
first instructors in our school, who
automobile manufacture. That the aerial
was turned down flat on account of his

the wealthy sportsmen who have been accepted by the Government as filers and are in service, will never be satisfied to go back to the twenty-five or thirty miles an hour of the automobile after being accustomed to a pace of ninety to 130 miles an hour with the birds—faster than the birds, in fact, for they rarely reach ninety miles' speed. The small combat planes have a landing speed of 160 M. P. H., and often attain in flight a 150 mile rate. Do you think men ac-customed to that will be content with a slow moving automobile? They would all the time be trying to hit it up, and would come in contact with persons and olice judges and things.

It was the rich man who put the

automobile industry on its feet in the beginning. A car cost so much in price and upkeep that only a rich man could afford one, and the high priced and high speed cars were the toys of the rich man. There are a lot of men in the automotive came to-day who can remember when off the ground, and one is just as com-t was commonly predicted that the auto- fortable as if on earth. He may look

but they will not last forever—and when planes may be purchased compar-ably with autos and the trained fliers are back here there will be a demand for planes. Then it will be a case of perfecting and standardizing and developing the plane for commercial and pleasure flight; they will naturally The Liberty Loan Committee has congratulated the automobile men of the
city on the great punch they put into
their drive for the sale of \$20,000,000
only stopped taking subscriptions on this
acquired some experience in quantity
acquired some experience in quantity
acquired some of the war, and in standardizing, both in engines and planes. Some genius will come from chines able to carry loads of bombs, this who will revolutionize the trans-portation and commercial forces of the London to Paris. It is only necessity

and possessed of extraordinary qualifi- York in time for the theatre and exceptions. The stringent demands of the no more attention than a trip by army examining board for pilots fos. Tweutleth Century flier to Chicago. ered the belief that a pilot must possess

bilities of Flying.

Well, the theorists didn't know it all. Some older men were highly successful in the air, and health did not always count. One of the notable cases is that of Lieut. Godfrey Cabot, of the U. S. N. R. P., who took up flying when beyond the life meridian. This man of past 50 has become one of the most for Airplane Mechanics, New York City.

By FRANK F. TENNEX.

Principal West Side Y. M. C. A. School for Airplane Mechanics, New York City.

Well, the theorists didn't know it all. Some older men were highly successful. Planes are not uncertain to-day and the day, but you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the policis are learning how to avoid the dament of flight each day, but you rarely hear of a death. Planes are not uncertain teach of light each day, but you rarely hear of a death. Planes are not uncertain to-day and the cost cheapened to light each day, but you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the day. But you rarely hear of a death. Planes are not uncertain to-day and the cost cheapened to a control of the policis are learning how to avoid the day.

By FRANK F. TENNEX.

automobile manufacture. That the aerial tin lizzie is a surety is the belief of many automotive engineers; the only, uncertainty is as to who will henryford the aero.

It is absolutely certain that many of the wealthy sportsmen who have been the wealthy sportsmen who have been the many of the wealthy sportsmen who have been the wealthy sportsmen who have been the many of the wealthy sportsmen who have been the wealthy sportsmen who have been the wealth w time had been an exhibition flier and had done all sorts of stunts and had landed hundreds of times without trouble. They would not take him, however, and finally he went to Canada made a splendid record with the Royal Air Forces and is now flying overseas.

Flying requires no superhuman powers or abilities. Anybody can fly except the poor fellows who get sick riding in a trolley or steam car. few cannot stand any kind of me and of course could not fly. body can fly-if he has the price, and some day the planes will be comparable as cheap as the tin lizzies of the auto world, though the air is the car sick or the jag festive.

What about the terrifying sensations of flying? There sin't no such bird. It

is just like sitting down in a comfortable rocking chair and then lifting it poblic never would be anything clae than around or down to the ground quite as The airplane industry is at that same of our men on his first flight actually stage to-day—of course the war has brought some remarkable conditions, loop aloft until a friend below assured by the same of the same of our men on his first flight actually was not sure that he had looped the brought some remarkable conditions, loop aloft until a friend below assured. him that it really had been done. one is thrilled on the first flight, but it is the exultation of a new experience n new accomplishment-and not fright.

ily types, but there will be excursion passenger planes and probably regular service between cities. With the devel opment of large machines under the dimulus of war conditions we are buildthe other day one carried a plane from But you say that only a few people for passengers. It ought to be possible can fly. Nonsense: almost any book after the war for a business man to can fly after a short training. Two take a plane for Washington, lunch years ago a man who could fly was looked upon as something superhuman.

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the smallest detail.

but often wishes he could be in two of three places at once. With the airpans it at least will be possible to make them the same day. more than the average mental and physical requirements—that flying was only for the favored few. There were special age limitations. Men must be young: in the army 20 to 30, preferably below 25; and in the navy, 18 to 25, preferably below 20.

Well, the theorists didn't know it all.

understand this and are preparing for it. The fact that every nuto factory to-day is at work on aero engines, or planes or some part, will make it easy after the war to establish the aero as a part of the automotive industry on thoroughly commercial basis,

The possibilities of the airplane in mail service are being tested now, and it is regarded that the mail route of after the war will be aeral. Light package transportation also will be aerial and this will relieve congested railroads. Newspapers will have aerial service and will then be able to get a picture from Chicago in thee for the early edition. Chicago in the for the early edition. Then, too, the places untouched by the railways can have the morning papers

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